

Course Number/Name: Psy 5250/6250 / Applied Statistics

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Course Information Spring 2019

GOALS AND OBJECTIVES:

Course Description: Psy 5250/6250 is a graduate-level examination of statistical procedures commonly used in the health, social and behavioral sciences. Topics include: sampling distributions, probability, confidence intervals, t tests, ANOVA, correlation, simple and multiple regression, chi-square (goodness of fit and test for association), data transformations, contemporary robust statistical procedures, and the problems with and alternatives to null hypothesis significance testing. The course is being offered as an online class.

Prerequisites: College-level intermediate algebra (or higher level math class).

Course Goals: The class is designed to be a graduate-level course in statistics for those who have not taken an undergraduate statistics class, or who have but would like to go through the material at a more sophisticated level than what is provided in a typical undergraduate statistics course. Statistics is a vast topic, and there are limits to how much can be covered in one semester. The focus of the class will be on developing a solid conceptual foundation that will serve those who need to read and evaluate statistical work in their discipline, as well as to provide a set of basic tools for those who need to perform statistical analyzes of their own data. The course should also serve as a good foundation for students who are preparing to take more sophisticated and specialized courses on statistics in their graduate program. The primary statistical tool used in the course is SPSS. It is assumed that the students enter the course with little to no knowledge of SPSS. By the end of the semester they should be able to intelligently perform essential statistical analysis with the software.

EXPECTATIONS FOR STUDENTS IN COURSE:

Your grade in the class will be based upon your performance on the following:

- 35% Online Homework and Study Group Assignments
- 5% Online Quizzes
- 60% Proctored Exams

It is important to make steady progress through the material. Students will need to hand in the assignments and quizzes by their due dates and take the four exams when scheduled. Most of the assignments and quizzes may be handed in significantly before their due dates if desired. The

course policy for requesting deadline extensions is described in the syllabus and is strictly adhered to. The proctoring of the exams is provided by U Online who can arrange for exams to be taken out-of-area. Incompletes follow the guidelines provided by the university. There is no extra credit available in the class but the homework assignments and quizzes may be redone and resubmitted if they are resubmitted by their due date. For more details on these policies please see the course syllabus.

REQUIRED/RECOMMENDED COURSE MATERIALS:

Textbook (required): Applied Statistics (2nd Edition). Oakley Gordon. The textbook was adapted from my lecture notes. All of the material for the class is provided through the textbook, there are no recorded lectures. The book is available through Lulu on-demand publishing, it is a 435 page paperback book which sells for \$30 (plus shipping). My using Lulu means that you won't be able to resale your book to the bookstore at the end of the semester, but on the other hand the price of the book is significantly lower than you would pay for a used copy of a typical textbook. Please be aware that in accordance with university policy I do not benefit financially from having you purchase this book. To purchase the book go to:

<http://www.lulu.com/shop/oakley-gordon/applied-statistics-2nd-edition/paperback/product-23503606.html>

Calculator: you will need a calculator for the class, but it does not need to be anything fancy, as long as it computes square roots. You may use a calculator during the proctored exams (you'll need it). You may not use a phone, tablet, laptop computer, or any device that would make it possible to communicate with others during the exam.

Course Software

1. **Canvas.** All of the course material will be hosted on the course's Canvas site.
2. **Oak Software.** The course involves the use of custom statistical software. If your browser can handle Canvas it should also be able to handle the custom software. To test your browser's ability to handle the custom software go to <http://content.csbs.utah.edu/~gordon/OakToolsJS/> and see if a window appears with various probability tools. If not you may need to upload the newest version of your browser, change browsers, or move to another computer.
3. **SPSS.** SPSS is a widely used statistical software package. Teaching you how to use SPSS is an important goal of this course and it also will free us from having to cover how to do the more complicated statistical computations by hand (in real life if you have to analyze data you will probably use a statistical program such as SPSS). SPSS 23 is available for you to access for free over the internet to use on your home computer through the College of Social and Behavioral Sciences (CSBS) Computing Center. You will need to install an application (Citrix Receiver) to access it. SPSS is also available in the CSBS computer labs.

4. **GPower 3.** This handy piece of software is available to download for free for both Macs and PCs. It too is available in the CSBS computer labs.

List of Assignments, Quizzes, and Exams (due dates are available through Canvas).

- Study Group Assignment: Introduce Yourself
- Introduction to the Course Assignment
- Foundations Assignment
- Graphing Assignment
- Central Tendency Assignment
- Variability Assignment
- Statistics and Parameters Assignment
- Standard Deviations and Standard Scores Assignment
- Sampling Distribution of the Mean Assignment
- Probability Assignment
- Quiz 1
- Study Group Exam 1 Assignment
- Exam 1
- Null Hypothesis Assignment
- t Test for a Single Group Mean Assignment
- One-Tailed Tests and Assumptions Assignment
- Effect Size and Power Assignment
- Confidence Interval Assignment
- Outliers and Normality Assignment
- Robust Statistical Methods Assignment
- t Test for Two Independent Groups Assignment
- Effect Size, Power, Confidence Interval 2 Independent Groups Assignment
- Quiz 2
- Study Group Exam 2 Assignment
- Exam 2
- Assumptions, Data Transformations, Robust Analysis Assignment
- t Test for Dependent Groups Assignment
- One Way ANOVA (Part 1) Assignment
- One Way ANOVA (Part 2) Assignment
- Comparisons Assignment
- Other ANOVAs Assignment
- Quiz 3
- Study Group Exam 3 Assignment
- Exam 3
- Correlation Assignment
- Simple Regression Assignment
- Multiple Regression Assignment
- Chi Square Assignment
- Quiz 4
- Study Group Exam 4 Assignment
- Exam 4